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EXAMINER	
STEADMAN, DAVID J	

ART UNIT	PAPER NUMBER
1652	

DATE MAILED: 02/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/989,975	ABE ET AL.	
	Examiner	Art Unit	
	David J Steadman	1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) *17-21,25-27,29-31,34-36 and 38* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16,22-24,28,32,33 and 37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5/6/02; 6/10/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Status of the Application

[1] Claims 1-38 are pending in the application.

Election/Restriction

[2] Applicants' election without traverse of the invention of Group I, claims 1-16, 22-24, 28, 32-33, and 37, filed December 23, 2003, is acknowledged.

[3] Claims 17-21, 25-27, 29-31, 34-36, and 38 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

[4] Claims 1-3, 5-13, 28, 32-33, and 37 are being examined only to the extent the claims read on the elected subject matter.

Information Disclosure Statement

[5] All references cited by applicants in the information disclosure statements (IDSs) filed May 06, 2002 and June 10, 2002 have been considered by the examiner with the exception of reference CH cited in the IDS filed May 06, 2002. This reference is a duplicate of reference AM cited in the IDS filed June 10, 2002. A copy of each IDS is attached to the instant Office action.

Specification/Informalities

[6] The specification is objected to in the use of the symbol "□" at page 29, line 31; page 32, line 5; page 37, line 22; page 38, lines 11 and 18. It is unclear

as to the meaning of the symbol "□". It appears that this is a typographical error, it is suggested that applicants amend the specification to replace "□" with an identifiable symbol. While the examiner has made every attempt to identify the presence of "□" in the specification, applicants are requested to replace the symbol "□" throughout the specification where not indicated above.

Claim Objections

[7] Claim(s) 14, 16, and 22 are objected to because of the following informalities: the term "wherein yeast cell wall" is grammatically incorrect and should be replaced with, for example, "wherein the yeast cell wall". Appropriate correction is required.

[8] Claim(s) 33 is objected to because of the following informalities: the term "on the surface layer a cell wall" is grammatically incorrect and should be replaced with, for example, "on the surface layer of a cell wall". Appropriate correction is required.

Claim Rejections - 35 USC § 112, Second Paragraph

> The following is a quotation of the second paragraph of 35 U.S.C. 112:
>
> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

[9] Claim(s) 1-2, 5-16, 22-24, 28, 32-33, and 37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point

out and distinctly claim the subject matter which applicant regards as the invention.

[10] Claims 1 (claims 5-6 dependent therefrom), 2, 7, 8 (claims 9-10 and 32-33 dependent therefrom), 11 (claims 12-13 and 28 dependent therefrom), and 37 are indefinite in the recitation of "a yeast Pir (protein internal repeat) cell wall protein coding sequence", "a Pir (protein internal repeat) motif coding sequence", or "a yeast cell wall protein coding sequence" as the specification fails to teach which identifying characteristics distinguish "a yeast Pir (protein internal repeat) cell wall protein coding sequence", "a Pir (protein internal repeat) motif coding sequence", or "a yeast cell wall protein coding sequence" from other yeast cell wall coding sequences. The specification defines the term at pages 16-17. However, based on this definition, it is unclear as to the scope of yeast cell wall protein coding sequences that are intended to be encompassed by this term. It is suggested that applicants identify the intended coding sequence(s) by, for example, the use of a sequence identifier.

[11] Claim 6 recites the limitation "the enzyme". There is insufficient antecedent basis for this limitation in the claim. It appears the claim should depend from claim 5 and it has been examined accordingly.

[12] Claim 7 recites the limitation "the Pir (protein internal repeat) protein motif coding sequence". There is insufficient antecedent basis for this limitation in the claim. It appears the claim should depend from claim 2 and it has been examined accordingly.

[13] Claim 9 (claim 10 dependent therefrom) is confusing in the recitation of "expression cassette... comprising an expression vector". The art recognized meanings of the terms and the definitions of the terms "expression cassette" and "expression vector" as set forth at page 13 of the specification would suggest that an expression cassette comprises essential elements for nucleic acid expression, *e.g.,* promoter and coding sequence, which is typically a portion or subsequence of an expression vector. As such, it is suggested that, for example, applicants amend the claim as follows: An expression vector comprising the expression cassette of claim 8.

[14] Claim 10 is confusing in the recitation of "the expression vector comprises a yeast expression vector". It appears that applicants' intent is for the expression vector to BE a yeast expression vector and not to comprise a yeast expression vector and the claim has been examined accordingly. It is suggested that, for example, applicants amend the claim (in accordance with the suggestion provided above for amending claim 9) as follows: The expression vector of claim 9, wherein the expression vector is a yeast expression vector.

[15] Claim 12 (claim 28 dependent therefrom) is confusing in the recitation of "the host cell... ...comprising a yeast host cell". It appears that applicants' intent is for the host cell to BE a yeast host cell and not to comprise a yeast host cell and the claim has been examined accordingly. It is suggested that, for example, applicants amend the claim as follows: The host cell of claim 11, wherein the host cell is a yeast host cell.

[16] Claims 13 and 22 (claim 23 dependent therefrom) are unclear in the recitation of "host cell... ...comprising a yeast cell wall" (claim 13) and "microorganism comprising a yeast cell wall". The claims are unclear as the examiner knows of only a single type of cell that comprises a yeast cell wall - namely a yeast cell and there is no evidence in the specification or the prior art of record of host cells or microorganisms (other than yeast cells) that comprise a yeast cell wall and, as such, the intended scope of claimed host cells of claim 13 and microorganisms used in the method of claim 22 is unclear. It is suggested that applicants clarify the claims.

[17] Claims 14 (claims 32-33 dependent therefrom), 15-16, 22 (claims 24 dependent therefrom), 23, and 28 are indefinite in the recitation of "useful protein" as a protein considered to be useful by one of skill in the art may not be considered useful by another and therefore, it is unclear as to the scope of useful protein coding sequences. It is suggested that applicants replace the term with an alternate term that has a definite meaning.

[18] Claims 14 (claim 15 and 32-33 dependent therefrom), 16, and 22 (claims 23-24 dependent therefrom) are confusing in the recitation of "a protein comprising an amino acid derived from an amino acid sequence". It appears applicants' intent is for the term to recite "a protein comprising an amino acid sequence derived from an amino acid sequence" (underline added for emphasis) and the claim has been examined accordingly. It is suggested that applicants clarify the meaning of the claims.

[19] Claim 24 is confusing in the recitation of "the microorganism comprises a yeast". It appears that applicants' intent is for the microorganism to BE a yeast and not to comprise a yeast and the claim has been examined accordingly. It is suggested that, for example, applicants replace the term "the microorganism comprises a yeast" with, for example, "the microorganism is a yeast".

[20] Claims 28 and 33 are drawn to methods for producing an immobilized enzyme, however it is noted that the polypeptide expressed by the host cell of claim 12 (as recited in claim 28) or the transformant of claim 32 (as recited in claim 33) is not limited to an enzyme and instead expresses a peptide or polypeptide and therefore, the methods of claims 28 and 33 will not necessarily result in production of an immobilized enzyme. Regarding claim 28, it is noted that not all enzymes are "useful" proteins as recited in the claim. It is suggested that applicants clarify the meaning of the claims by the use of consistent terminology.

Claim Rejections - 35 USC § 112, First Paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

[21] Claims 1-16, 22-24, 28, 32-33, and 37 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contain subject matter which was not described in the specification in

such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of he claimed invention.

The claims are drawn to a genus of chimeric nucleic acids, expression cassettes, expression vectors, host cells, and transformants and methods for producing a genus of immobilized enzymes using said host cells or transformants.

For claims drawn to a genus, MPEP § 2163 states the written description requirement for a claimed genus may be satisfied through sufficient description of a *representative number of species* by actual reduction to practice, reduction to drawings, or by disclosure of relevant, identifying characteristics, i.e., structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between function and structure, or by a combination of such identifying characteristics, sufficient to show the applicant was in possession of the claimed genus. See *Eli Lilly*, 119 F.3d at 1568, 43 USPQ2d at 1406. MPEP § 2163 states that a representative number of species means that the species which are adequately described are representative of the entire genus. Thus, when there is substantial variation within the genus, one must describe a sufficient variety of species to reflect the variation within the genus. In this case, the specification discloses only the following representative species of the genus of chimeric nucleic acids: a chimeric nucleic acid comprising a first domain encoding SEQ ID NO:1 and a second domain encoding a naturally occurring wild-type *S. pombe* Gma12, wherein the encoding

sequence is amplified by SEQ ID NO:5 and 6, a second domain encoding a naturally occurring wild type human alpha-1,3-FucT, wherein the encoding sequence is amplified by SEQ ID NO:7 and 8, a second domain encoding a naturally occurring wild-type *S. cerevisiae* KRE2, wherein the encoding sequence is amplified by SEQ ID NO:9 and 10, or a second domain encoding a naturally occurring wild-type *S. cerevisiae* MNN1, wherein the encoding sequence is amplified by SEQ ID NO:13 and 14. In the instant case, the genus of chimeric nucleic acids encompasses species that are WIDELY variant in their structures and further encompass nucleic acids that encode polypeptides that are WIDELY variant in their functions. As such, the disclosure of the representative species as stated above is insufficient to be representative of the attributes and features of *all* species encompassed by the claimed genus of chimeric nucleic acids. Given the lack of description of a representative number of chimeric nucleic acids, the specification fails to sufficiently describe the claimed invention in such full, clear, concise, and exact terms that a skilled artisan would recognize that applicant was in possession of the claimed invention.

[22] Claim(s) 1-16, 22-24, 28, 32-33, and 37 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a chimeric nucleic acid comprising a first domain encoding SEQ ID NO:1 and a second domain encoding a naturally occurring wild-type *S. pombe* Gma12, wherein the encoding sequence is amplified by SEQ ID NO:5 and 6, a second domain encoding a naturally occurring wild type human alpha-1,3-FucT, wherein the encoding sequence is amplified by SEQ ID NO:7 and 8, a second domain

encoding a naturally occurring wild-type *S. cerevisiae* KRE2, wherein the encoding sequence is amplified by SEQ ID NO:9 and 10, a second domain encoding a naturally occurring wild-type *S. cerevisiae* MNN1, wherein the encoding sequence is amplified by SEQ ID NO:13 and 14, or a second domain encoding a naturally occurring wild-type rat alpha2,3-sialyltransferase does not reasonably provide enablement for a chimeric nucleic acid comprising a first domain comprising all yeast Pir cell wall protein coding sequences and optionally wherein the Pir cell wall protein is any variant of SEQ ID NO:1 that is capable of being localized or immobilized on a yeast cell wall and a second domain comprising all peptide or polypeptide coding sequences as broadly encompassed by the claims. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

It is the examiner's position that undue experimentation would be required for a skilled artisan to make and/or use the entire scope of the claimed invention. Factors to be considered in determining whether undue experimentation is required are summarized in *In re Wands* (858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988)) as follows: (A) The breadth of the claims; (B) The nature of the invention; (C) The state of the prior art; (D) The level of one of ordinary skill; (E) The level of predictability in the art; (F) The amount of direction provided by the inventor; (G) The existence of working examples; and (H) The quantity of experimentation needed to make or use the invention based on the content of the

disclosure. See MPEP § 2164.01(a). The Factors most relevant to the instant rejection are addressed in detail below.

- The claims are overly broad in scope: The claims are so broad as to encompass a chimeric nucleic acid comprising a first domain comprising all yeast Pir cell wall protein coding sequences and optionally wherein the Pir cell wall protein is any variant of SEQ ID NO:1 that is capable of being localized or immobilized on a yeast cell wall and a second domain comprising all peptide or polypeptide coding sequences as broadly encompassed by the claims. The broad scope of recited chimeric nucleic acids, expression vectors, host cells, and transformants is not commensurate with the enablement provided by the disclosure with regard to the extremely large number of chimeric nucleic acids broadly encompassed by the claims. In this case the disclosure is limited to a chimeric nucleic acid comprising a first domain encoding SEQ ID NO:1 and a second domain encoding a naturally occurring wild-type *S. pombe* Gma12, wherein the encoding sequence is amplified by SEQ ID NO:5 and 6, a second domain encoding a naturally occurring wild type human alpha-1,3-FucT, wherein the encoding sequence is amplified by SEQ ID NO:7 and 8, a second domain encoding a naturally occurring wild-type *S. cerevisiae* KRE2, wherein the encoding sequence is amplified by SEQ ID NO:9 and 10, a second domain encoding a naturally occurring wild-type *S. cerevisiae* MNN1, wherein the encoding sequence is amplified by SEQ ID NO:13 and 14, or a second domain encoding a naturally occurring wild-type rat alpha2,3-sialyltransferase.

- The lack of guidance and working examples: The specification provides only four working examples of the claimed or recited chimeric nucleic acid *i.e.*, Examples 1-9 as set forth at pages 27-34 of the instant specification. These working examples fail to provide the necessary guidance for making the entire scope of claimed or recited chimeric nucleic acids. In this case, the first domain of the claimed or recited chimeric nucleic acid encompasses a yeast Pir cell wall protein coding sequence, including those that have yet to be isolated and mutants of those isolated and yet to be isolated. Furthermore, the second domain of the claimed or recited chimeric nucleic acid encompasses any peptide- or polypeptide-encoding sequence, which encompasses a vast number of coding sequences, including those yet to be isolated and mutants of those isolated and yet to be isolated. The specification provides no guidance for isolating other Pir-encoding sequences from other yeast and provides no guidance for mutating known and yet to be isolated Pir and all other protein-coding sequences.

- The high degree of unpredictability in the art: The encoding nucleic acid sequence for a given polypeptide determines the protein's structural and functional properties. Predictability of which changes can be tolerated in a protein's amino acid sequence and obtain the desired activity requires a knowledge of and guidance with regard to which amino acids in the protein's sequence, if any, are tolerant of modification and which are conserved (i.e., expectedly intolerant to modification), and detailed knowledge of the ways in which the proteins' structure relates to its function. The positions within a protein's sequence where modifications can be made with a reasonable

expectation of success in obtaining an encoded polypeptide having the desired activity/utility are limited in any protein and the result of such modifications is highly unpredictable. In addition, one skilled in the art would expect any tolerance to modification for a given protein to diminish with each further and additional modification, e.g. multiple substitutions. In this case, the necessary guidance has not been provided in the specification as explained in detail above. Thus, a skilled artisan would recognize the high degree of unpredictability in making the entire scope of chimeric nucleic acids encoding proteins having the desired activity.

- The state of the prior art supports the high degree of unpredictability: The state of the art provides evidence for the high degree of unpredictability in altering a polynucleotide sequence with an expectation that the encoded polypeptide will maintain the desired activity/utility. For example, Branden et al. ("Introduction to Protein Structure", Garland Publishing Inc., New York, 1991) teach "[p]rotein engineers frequently have been surprised by the range of effects caused by single mutations that they hoped would change only one specific and simple property in enzymes" and "[t]he often surprising results of such experiments reveal how little we know about the rules of protein stability... ...they also serve to emphasize how difficult it is to design *de novo* stable proteins with specific functions" (page 247). While it is acknowledged that this reference was published in 1991, to date there remains no certain method for reasonably predicting the effects of even a *single* amino acid mutation on a protein.

- The amount of experimentation required is undue: While methods of isolating variants of a protein-encoding sequence are known, *e.g.*, by site-directed mutagenesis or hybridization, it is not routine in the art to screen for *all* polypeptide-encoding sequences having a substantial number of modifications, as encompassed by the instant claims. Thus, in view of the overly broad scope of the claims, the lack of guidance and working examples provided in the specification, and the high degree of unpredictability as evidenced by the prior art, undue experimentation would be necessary for a skilled artisan to make and use the entire scope of the claimed invention.

Thus, applicant has not provided sufficient guidance to enable one of ordinary skill in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims. The scope of the claims must bear a reasonable correlation with the scope of enablement (*In re Fisher*, 166 USPQ 19 24 (CCPA 1970)). Without sufficient guidance, determination of having the desired biological characteristics is unpredictable and the experimentation left to those skilled in the art is unnecessarily, and improperly, extensive and undue. See *In re Wands* 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

[23] Claim(s) 1-2, 4, 7-14, 16, 22, 24, and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Moukadiri et al. (*J Bacteriol* 181:4741-4745; cited by applicants in the IDS filed May 06, 2002). The claims are drawn to a genus of chimeric nucleic acids, expression cassettes, expression vectors, host cells, transformants and methods for producing a genus of immobilized proteins using said host cells or transformants. Moukadiri et al. teach an expression vector encoding a *Saccharomyces cerevisiae* Pir4 protein fused to Protein A (page 4744, right column, bottom). Moukadiri et al. teach that the fusion protein was expressed using a mutant strain of *S. cerevisiae* as an expression host and was targeted to the cell wall (page 4744, right column, bottom to page 4745, left column, top and Figure 4). This anticipates claims 1-2, 4, 7-14, 16, 22, 24, and 32 as written.

[24] Claim(s) 1-2, 4-16, 22-24, 28, 32-33, and 37 are rejected under 35 U.S.C. 102(b) as being anticipated by Matilla et al. (*Glycobiol* 6:851-859; cited by applicants in the IDS filed June 10, 2002) as evidenced by Moukadiri et al. The claims are drawn to a genus of chimeric nucleic acids, expression cassettes, expression vectors, host cells, transformants and methods for producing a genus of immobilized proteins and enzymes using said host cells or transformants. Matilla et al. teach construction of an expression vector encoding a *S. cerevisiae* Hsp150 protein fused to rat alpha2,3-sialyltransferase (page 852, left column and page 856, right column to page 857, left column). Matilla et al. teach that the

fusion protein was expressed using *S. cerevisiae* as an expression host and was targeted to the cell wall (page 852, right column to page 854, left column and Figure 3). Moukadiri et al. is used as an evidentiary reference to demonstrate that Hsp150 belongs to the Pir family of proteins (see page 4744, left column, bottom). See MPEP 2131.01 regarding the use of extra references to show the meaning of a term used in the primary reference. This anticipates claims 1-2, 4-16, 22-24, 28, 32-33, and 37 as written.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

[25] Claim(s) 1-16, 22-24, 28, 32-33, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matilla et al. in view of Moukadiri et al., Toh-e et al. (*Yeast* 9:481-489; cited by applicants in the IDS filed June 10, 2002), and Mrsa (*Yeast* 15:813-820; cited by applicants in the IDS filed June 10, 2002). The claims are drawn to chimeric nucleic acids, expression cassettes, expression vectors, host cells, transformants and methods for producing a genus of immobilized proteins including enzymes using said host cells or transformants.

Matilla et al. and Moukadiri et al. disclose the teachings as described above. Neither Matilla et al. nor Moukadiri et al. teach replacing their respective Pir protein with a Pir1 protein.

Toh-e et al. teach the nucleic acid sequence encoding a *Saccharomyces cerevisiae* Pir1 protein (page 483), represented by SEQ ID NO:1 (see attached sequence alignment). Toh-e teach that Pir1-3 proteins are highly homologous (page 481, abstract).

Mrsa et al. teach the equivalent characteristics of the four Pir proteins, including covalent attachment to the cell wall of *S. cerevisiae* by a similar mechanism (page 813, right column, bottom to page 814, left column).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to combine the teachings of Matilla et al., Moukadiri et al., and Toh-e to replace the Pir4- or Hsp150-encoding sequences in their respective vectors with a Pir1-encoding sequence. One would have been motivated to replace the Pir4- or Hsp150-encoding sequences in their respective vectors with a Pir1-encoding sequence because Pir1 is equivalent to the Pir4 and Hsp150 proteins as evidenced by Toh-e et al. and Mrsa et al. (see MPEP 2144.06 regarding art-recognized equivalence). One would have a reasonable expectation of success for replacing the Pir4- or Hsp150-encoding sequences in their respective vectors with a Pir1-encoding sequence to express a fusion protein that is targeted to the *S. cerevisiae* host cell wall because of the results of Matilla et al., Moukadiri et al., Toh-e et al., and Mrsa et al. Therefore, claims 1-16, 22-24, 28, 32-33, and 37, drawn to a chimeric nucleic acids, expression cassettes, expression vectors, host

cells, transformants and methods for producing a genus of immobilized proteins including enzymes using said host cells or transformants would have been obvious to one of ordinary skill in the art.

Conclusion

[26] Status of the claims:

- Claims 1-38 are pending.
- Claims 17-21, 25-27, 29-31, 34-36, and 38 are withdrawn from consideration.
- Claims 1-16, 22-24, 28, 32-33, and 37 are rejected.
- No claim is in condition for allowance.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Steadman, whose telephone number is (571) 272-0942. The Examiner can normally be reached Monday-Friday from 7:00 am to 5:00 pm. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Ponnathapura Achutamurthy, can be reached at (571) 272-0928. The FAX number for submission of official papers to Group 1600 is (703) 308-4242. Draft or informal FAX communications should be directed to (571) 273-0942. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Art Unit receptionist whose telephone number is (703) 308-0196.

David J. Steadman, Ph.D.
Patent Examiner
Art Unit 1652

02-17-04